

REMARKS

In the outstanding office action, the prior rejections and allowances have been withdrawn. New grounds of rejections have been asserted, based on different combinations of Allen, Maeda and Steinfield, all of which were previously of record.

Claims Rejections - 35 USC 103

Claims 40-43, 46, 49-62, 65-76 and 78 stand rejected as being unpatentable over Allen in view of Maeda. This ground of rejection is respectfully traversed on the grounds that a prima facie case of obviousness has not been established, and the applied references do not teach or suggest the claimed invention.

Applicants disagree with the Examiner's recitation of alleged teachings of Allen and Maeda. Moreover, regarding Claims 40, 41 and 78, neither reference teaches or suggests, for example, a printhead having the following features:

the barrier/orifice structure further comprising a continuous rib portion extending between adjacent first and second ones of the plurality of nozzle columns and over said ink feed slot to fluidically separate the first and second ones of the nozzle columns [Claim 40]

the barrier/orifice structure further comprising a continuous rib portion extending between adjacent first and second ones of the plurality of nozzle columns to fluidically separate the first and second ones of the nozzle columns, said continuous rib portion extending over said ink feed slot [Claim 41]

the barrier/orifice structure further comprising a continuous rib portion extending between adjacent first and second ones of the plurality of nozzle columns and over said ink feed slot to fluidically separate the first and second ones of the nozzle columns [Claim 78]

As for Claims 46, 56, 65 and 73, there is no motivation to modify Allen with alleged teachings of Maeda to arrive at the claimed invention.

Allen describes a multitone printer and method of operation, wherein 3 binary-weighted drop generators are fired in sequence. (Abstract) The Examiner states that Allen discloses "a columnar group of drop generators (FIG. 5A, elements 84, 86, 88) formed on the surface that are arranged in subgroups each comprising at least two drop generators (FIG. 3B, 5A; a group of three different-size nozzles)..." However, amended Claims 46, 56, 65 and 73 are distinguished from Allen, which does not include the following exemplary limitations:

a columnar group of drop generators formed on the surface that are arranged into subgroups each comprising at least two drop generators, each of said subgroups supplied with fluid through the fluid supply slot, each subgroup being fluidically isolated from other subgroups on the surface, the columnar group of drop generators arranged in a column transverse to a direction of relative movement between the printhead and a print medium [Claim 46]

a printhead substrate having a surface on which is formed a columnar group of drop generators that are arranged into subgroups, each of the subgroups including more than one drop generator, one or more fluid feed slots formed through the substrate to provide fluid to the drop generators in the columnar group, the subgroups being fluidically isolated from each other on the surface, the columnar group of drop generators arranged in a column transverse to a direction of relative movement between the printhead and a print medium [Claim 56]

providing a printhead having a substrate surface with a columnar group of drop generators formed on the surface that are arranged into subgroups each comprising more than one drop generator, the columnar group of drop generators arranged in a column transverse to a direction of relative movement between the printhead and a print medium [Claim 65]

a barrier/orifice structure supported by the substrate and defining an array of nozzles arranged in a plurality of nozzle columns and an array of firing chambers in correspondence with correspondence with the array of nozzles, the nozzles columns arranged transverse to a direction of relative movement between the printhead and a print medium [Claim 73]

The Examiner further alleges that it would have been obvious to use the "concept of fluidically isolated feeding each nozzle/drop generator subgroup as disclosed by Maeda to modify the printhead disclosed by Allen such that drop generators in adjacent are subgrouped and each subgroup is fluidically isolated from other subgroups by a different fluid supply slot. The motivation of doing so is to avoid crosstalk in order to be capable of constantly maintaining good stable ink ejection conditions to obtain high quality images as taught by Maeda (column 3, lines 34-48)." Applicants respectfully disagree that the foregoing establishes a motivation to modify Allen with selected teachings of Maeda.

First, the quoted passage from Maeda recites an object of Maeda, which is said to be achieved by dispersively distributing over the heater surface the erosion action of cavitation collapse pressure caused when a bubble collapses. Maeda at 3:34-48 does not mention avoidance of crosstalk. Thus, the Examiner has failed to provide a motivation to combine the references.

Second, modification of Allen with teachings of Maeda would apparently render Allen unsuitable for its intended purpose. Allen expressly teaches that the subgroup drop ejectors (as chosen by the Examiner) are to be fired in sequence (see abstract). Yet the proposed modification would result in two drop generators in a subgroup not being driven in sequence. (See paragraph bridging pages 4-5 of office action) If modified in this fashion, Allen would be unable of performing its intended function, i.e. printing droplets of ink with volumes weighted in a binary sequence. Hence there can be no suggestion or motivation to make the proposed modification. MPEP 2143.01, citing In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984).

Because a motivation to combine has not been established, and because the proposed modification would result in Allen being rendered unsatisfactory for its intended purpose, a prima facie case of obviousness has not been established, and the rejection should be withdrawn. The rejection is the product of attempted hindsight reconstruction, using teachings found only in applicants' specification as the basis for an obviousness rejection.

The claims depending from the independent claims 40, 41, 46, 56, 65, 73 and 78 add further limitations and further define the claimed subject matter. The rejection of these claims should also be withdrawn.

Claims 44, 47-48, 63, 64 and 77 stand rejected as being unpatentable over Allen in view of Maeda and Steinfield et al. ("Steinfield"). The rejection is respectfully traversed on the grounds that a prima facie case of obviousness has not been established and the applied references do not teach or suggest the claimed invention.

These rejected claims depend from independent claims discussed above, and are allowable for reasons similar to those given with respect to the corresponding independent claims.

The Examiner alleges that Allen, as modified, discloses the claimed invention except wherein the printhead electronics activates the drop generators in the columnar group of drop generators one at a time, wherein the columnar group of drop generators is a primitive, and the substrate comprises a plurality of primitives arranged in a column, wherein the nozzles of each nozzle column have a pitch of 600 nozzles per inch. Applicants respectfully disagree that Allen can properly be modified by Maeda to arrive at the claimed invention.

The Examiner further alleges that it would have been obvious to modify the printhead disclosed by Allen, as modified, such that arranging the nozzles/drop generators in a plurality of primitives in which only one nozzle/drop generator is activated at a time as disclosed by Steinfield et al. The motivation of doing so is to reduce the number of interco (sic) components needed to electrically connect the printhead to the printer unit in order to improve production and operating efficiency as taught by Steinfield et al."

This line of reasoning fails to provide a prima facie of obviousness, for the reasons already discussed above regarding the attempted modification of Allen with teachings of Maeda.

Withdrawal of this ground of rejection is respectfully requested.


New Claims 80-83

These new claims add limitations further defining the ink feed slot, e.g. as an elongated trench extending along a length of said nozzle columns, as in Claim 81. This feature is fully supported by applicants' specification, e.g. at 6:15, and FIG. 8. These new claims further distinguish the claimed subject matter from the applied references and are also in condition for allowance.

CONCLUSION

The outstanding rejections have been addressed, and the application is in condition for allowance. Such favorable reconsideration is solicited.

Respectfully submitted,



Larry K. Roberts
Registration No. 28,464

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Law Offices of Larry K. Roberts, Inc.
P.O. Box 8569
Newport Beach, CA 92658-8569
Telephone (949) 640-6200
Facsimile (949) 640-1206